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URBAN LAND

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INDUSTRIAL PLANT PARKING

A RECOMMENDED PRACTICE BY THE INSTITUTE OF TRAFFIC ENGINEERS

TYPICAL PLANT TRAFFIC FACILITIES

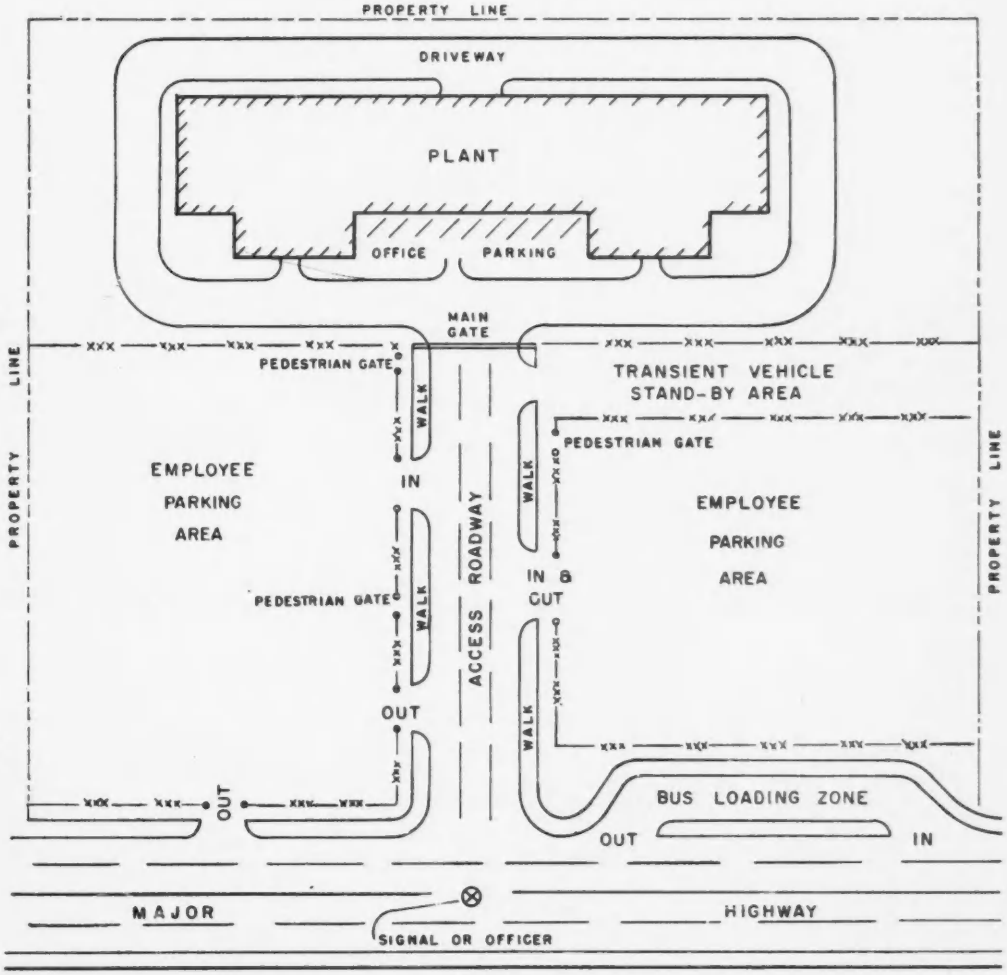

Figure 3

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Richard J. Seltzer

It is with deep regret that we advise the membership of ULI of the passing of Richard J. Seltzer of Philadelphia on Thursday, May 14.

For those in the Institute who knew him well, little can be added here that will contribute further to the respect and affection in which he was held by his fellow Trustee and Council associates. For those who did not, we would be remiss if his great contributions to ULI through the years were passed over here.

Mr. Seltzer became a member of the Board of Trustees in 1942 and served continuously and actively to the time of his death. His was one of the famous "Downtown Proposals" prepared for and published by ULI in 1942, in this instance on his home city of Philadelphia.

He served as President of the Institute during the critical years of 1948, 1949 and 1950. To him, more than to any other individual goes the credit of bringing the Institute to a sound financial position and for developing the concept of the panel study as both a major civic contribution to the urban field and as a financial base for the furtherance of ULI activities and objectives. He was one of the only two men who served on the Executive Groups of all three Councils of ULI. With Walter Schmidt, he was responsible for actively sponsoring the formation of the Industrial Council of which he was Vice Chairman from its inception.

His forceful, dynamic drive on behalf of ULI did not end here, however, but extended fully through his personal interest in the members of the ULI staff and the student seriously concerned with urban problems.

As Trustee of the ULI Retirement Plan and Trust, he conceived and saw through the establishment and operation of a sound program for the staff's benefit. He also worked tirelessly as Chairman of the J. C. Nichols Foundation of ULI to place it on a financial base whereby grants-in-aid could be made each year to a graduate student for research in the urban field.

This by no means completes the list. Perhaps his service to ULI and the urban field is best summed up in the testimonial presented to him by his fellow Trustees upon his retirement as President at the end of 1950:

"Testimonial

Presented by the Urban Land Institute to

RICHARD J. SELTZER

For his significant service as its

President

during the years 1948, 1949, 1950

"During whose term of office this Institute has come to find its pronouncements recognized as authoritative throughout the nation in various fields of practical real estate research and through whose initiative have been personally developed new fields of activity which should provide this Institute assurance of a sound and stable financial base for the future."

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THE 1959-60 J. C. NICHOLS AWARD

A cost revenue analysis of governmental services in a central business district will be the subject of ULI's J. C. Nichols Foundation's grant-in-aid award for the academic year 1959-60. The study will be undertaken by Raymond J. Green as part of his graduate work in the Department of City and Regional Planning of the University of North Carolina. Announcement of the $2,400 grant-in-aid awarded to Mr. Green, who is now assistant planner with the Charlotte-Mecklenburg Planning Commission is made jointly by the University and by the J. C. Nichols Foundation Committee of ULI.

INDUSTRIAL PLANT PARKING

A RECOMMENDED PRACTICE BY THE INSTITUTE OF TRAFFIC ENGINEERS

Editor's Note

Design features and operational controls are important factors in the layout of any large sized off-street parking facility. Where the driver parks his own car the proper layout for the parking area can be either a help or a hindrance to adjacent street traffic movement and to efficient use of the facility itself. This is true whether the area serves a municipality, a shopping center, or an industrial plant.

In "Industrial Plant Parking" we are offered the analysis and standards for industry which are the recommended practice of the Institute of Traffic Engineers. These recommendations are the report of a Committee of I.T.E. approved January 1959 by its Board of Direction.

Urban Land is indebted to the Institute of Traffic Engineers for permission to reprint this report which originally appeared in the March 1959 issue of *Traffic Engineering*. For information about reprints of this report, "Industrial Plant Parking," address Institute of Traffic Engineers, 2029 K Street, N. W., Washington 6, D. C.

Improper planning of parking facilities and the lack of positive traffic controls over the simultaneous movements of vehicles and pedestrians can only result in delay, confusion, conflict and accident exposure. These unhealthy conditions are particularly evident at plant approaches during periods of shift-change when competition for space is at its peak of intensity.

The solution can best be effected by a proper allocation of space and adoption of controls in proportion to the needs of the various traffic units involved; viz., pedestrians, employee vehicles, buses, taxicabs, transient vehicles and adjacent traffic streams.

The procedures and recommendations cited below are intended to guide and assist industrial management in evaluating parking and traffic problems, and applying the most practical solutions based on accepted standard practices.

Measuring the Problem

Plant facilities for the storage and movement of vehicles often *appear* well planned and controlled. However, as is typical of even the best designed facilities, peak demand for space usage at shift-change time creates unique and often crippling conditions which require that certain adjustments be made.

Deficient storage space for vehicles and traffic congestion are the major manifestations of inadequate facilities and may be identified and corrected through logical evaluation and study.

A. Evaluation

The most common evidence of need for study of this problem is the existence of one or more of the following conditions:

1. Congested curb parking on all sides of approach roadways.

2. Overflow parking of vehicles in plant yards and driveways, on adjacent private property, along highway shoulders, at "park" and "landscaped" areas, etc.

3. Vacant stalls left in existing parking lots, between shift-changes, despite evidence of overflow parking described under (1) and (2) above.

4. Insufficient loading space for buses, taxicabs, family cars and other "pick-up" vehicles resulting in angle and double parking in traffic lanes.

5. Disorderly arrangement of vehicles in existing parking lots resulting in wasted space and reduced storage capacity.

6. Lack of or misuse of directional signs and pavement markings to control vehicle placement and movements in parking lots.

7. Insufficient means of access and egress for parking lots.

8. Entrance and exit of vehicles through the main gates against mass employee movements.

9. Blocking off of emergency vehicle access to plant premises in the event of fire, explosion or other catastrophes.

10. Isolation of traffic components due to the "shifting" of freights on railroad sidings and grade crossings during critical shift-change period.

11. Continuous left-turning of vehicles from parking lots across heavy traffic streams.

12. Promiscuous loading and unloading of group riders on access streets *outside* of defined parking areas.

13. Insufficient sidewalks, crosswalks, loading zones, and other defined means of separating pedestrian traffic from vehicular traffic.

14. Mass employee crossings on main access roads by diagonal weaving through steadily moving traffic.

15. Unusual evidence of dead delays, stopping and starting, and overloading of immediate access roadways due to inadequate controls at adjacent intersections.

B. Survey

The first step in planning a smooth, safe traffic flow system for access roads and parking lots is an analysis of existing physical conditions: roadways available, parking spaces available in areas adjacent to these streets, amount of demand for roadways and parking facilities, etc.

The most detailed record of existing physical conditions can be obtained by the preparation of a map or plan which will include such information as:

1. *Parking Facilities*

(a) Boundaries and dimensions of all areas used for parking, showing the exact location of entrance and exit drives.

(b) Arrangement of parking aisles, driveways and stalls with dimensions and parking angle.

(c) Gateways to parking lots, including widths, whether used in one direction only or serving as both entrance and exit.

(d) Type of surface, night lighting facilities, location of directional signs and markings, type of enclosure, etc., for each parking area.

(e) Number of street curb spaces for parallel or angle parking.

(f) All violations of existing parking regulations in lots, at curbs and in plant yards and driveways.

(g) Total number of employee cars requiring parking space for each shift, including transient vehicles such as family cars, buses, taxicabs, etc., of short-time duration.

(h) Description and dimensions of unused areas adjacent to existing parking lots that might be available for expansion in event more space is needed.

2. *Pedestrian Facilities*

(a) Location and use of sidewalks, crosswalks, foot-bridges, tunnels and other pedestrain facilities.

(b) Location of loading and unloading points for buses, taxicabs, etc., that bring employees to or near plant gates.

(c) Routes followed by pedestrian employees from plant entrances to parking lots, bus loading zones, approach streets, etc.

(d) Total number of employees in each shift.

3. *Access Roadways*

(a) Width, alignment and number of traffic lanes of each roadway and driveway.

(b) Physical impediments such as railroad tracks, telegraph poles, fences, draw-bridges, adjacent plants and other features which may affect the flow of traffic and parking.

(c) Direction and volume of traffic flow on all access roadways to and from the plant and in and out of parking areas. Includes also direction from which buses, taxicabs and other transient vehicles approach and leave the plant vicinity.

(d) A 15-30-minute Monday and Friday traffic volume count, *just previous to the period of maximum shift-change,* on all adjacent access intersections. Include only that traffic which is not related to the plant. This count will provide a measure of the capacities of those highways which must absorb the plant traffic released.

(e) The location and timing of traffic control signals and officer controls at all points adjacent to the plant. The timing for traffic signals means the length of green interval provided each street, and the timing of officer control means the hours each day during which an officer or other deputized authority is assigned to a specific location to control traffic.

(f) Spot location of traffic accidents which have occurred as a result of plant traffic movements.

Analysis and Recommended Standards

Once all pertinent facts have been collected and recorded as on a map or plan, by field notes and by photographs, it is a simple procedure to isolate the problem areas and set up objectives.

For the purpose of quick analysis of the plant traffic problems, this section is devoted to a development of the design features and operational controls which are recognized as reasonably sufficient standards and norms. When existing plant traffic facilities show a marked deviation from these specifications, then recommendations for the adoption of corrective measures are warranted.

A. Parking Facilities

1. *Selection of Site:*

Parking area sites should be selected on the basis of land value, size requirements, the general shape and contours, and proximity to plant and access roadways.

(a) *Land values* — Generally, the problem of procuring additional land for parking development is not a costly problem with the isolated plant located on the city's "fringe." Consideration of land use for parking becomes extremely important, however, at plants located in congested industrial districts with high land valuation and usage.

(b) *Size requirements*—The overall amount of land required for parking depends upon the number of vehicles to be accommodated and the type of parking planned.

A shift of workers arriving before work to replace an equal or larger group that is leaving, imposes a load on the parking facilities which is about double that adequate for either shift. For a simple three-shift plant, the number of automobiles arriving for the next largest shift, when *added* to the number of automobiles needed for the main shift indicates the capacity of parking facilities required.

The best estimate of the actual number of cars to be accommodated is obtained through a questionnaire of employees of each shift. A quick rule of thumb measure would be one car for every two employees in each shift, based on current personnel ratios.

In general a parking area should provide approximately 60% of total square footage for storage and the remaining 40% for movement of cars.

(c) *Shape and contour of Land*—The shape of a land parcel will determine to a large degree whether more or less aisle space or maneuvering space is necessary. A regular rectangular shape with easy access from any two sides will permit an increase in storage capacity over that land which is irregular with limited access.

Land which is hilly, wooded or swampy will require considerable grubbing, clearing, and filling preliminary to final shaping and surfacing. The advantage of low land value for uncleared property may be far offset by large initial investment in making such land suitable for storage of vehicles.

(d) *Proximity to plant and access roadways*—Where practical and convenient, a parking facility should be placed in close proximity to the generator. Parking violations and property misuse by employees will be proportionate to the inconvenience caused them in traversing between the parking facility and the plant. A well-designed parking lot, incorporated as part of the plant premises, can add considerably to the functional efficiency and general appearance of the plant.

A parking facility should be located adjacent to one or more access streets of sufficient width (two 12 ft. lanes minimum) to permit turns into and out of the lot without serious conflict with moving traffic. The ideal situation is the placing of a parking facility *between* two one-way feeder roads, each having two lanes of 12 foot minimum width; one road carrying vehicles to the lot and the other carrying vehicles away from the lot. In no case should the parking facility be placed so that the feeder connections with main approach are restricted "bottlenecks" of insufficient width to receive and discharge vehicles using the parking facility.

2. *Layout of Parking Lots:*

The discussion to follow is based on "head-in" or "drive-in" parking at angles of 90, 60, and 45 degrees only. Although 45- and 60-degree angle parking is preferred from the standpoint of convenience in maneuvering, it is also true that these acute angles of parking require more space per stall and lack the flexibility of 90-degree parking, being less adaptable to irregular areas. It is, therefore, necessary to first ascertain the amount and shape of land available for storage purposes and the number of cars to be accommodated before a decision can be made as to which angle of parking is most suitable.

RECOMMENDED STALL AND AISLE DIMENSIONS FOR DRIVE-IN PARKING

Angle of Parking	Width of Stall	Depth of Stall Perpendicular to Aisle	Width of Aisle	Unit Parking Depth	Width of Stall Parallel to Aisle	Number of Stalls in Given Distance
O	W	L	A	UPD	W	D
90°	8′-6″	18′-0″	24′-0″	60′-0″	8′-6″	$\frac{D}{8.5}$
60°	8′-6″	18′-6″	18′-0″	55′-0″	9′-10″	$\frac{D\text{-}11}{9.8}$
45°	8′-6″	17′-6″	12′-0″	47′-0″	12′-0″	$\frac{D\text{-}17.5}{12}$

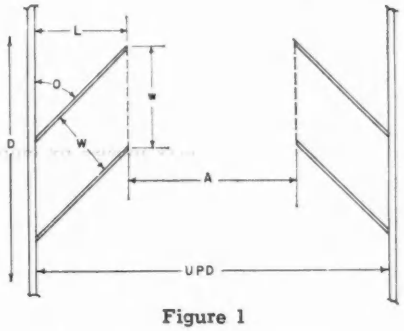

Figure 1

Experience has proven that in lots where employees park their own vehicles, stall dimensions less than an 8′ x 18′ minimum will result in serious space inconveniences and "crowding," which in turn cause damage to vehicles, time loss to parkers, and an overall inefficiency in lot operations. Current trends in vehicle design toward larger doors and exaggerated extremities would dictate that 8′-6″ x 18′-0 stalls are most practical. Figure 1, shows recommended stall and aisle dimensions for drive-in parking.*

(a) *Parking stall arrangement*—In fitting parking stalls and access aisles to the dimensions and shapes of land parcels, it is convenient to use the width of an aisle plus the length (or depth) of a stall on each side of it as a unit of measure. Authorities refer to this measure as the Unit Parking Depth and it has a particular value for each angle of parking.

Parking space will be used by employees with greater overall efficiency if each stall is carefully defined by lining or marking. The material to be used for designating stalls will depend, for the most part, upon the material used for surfacing the parking area. Obviously white or yellow paint is the most economical means of lining stalls on blacktop or concrete surfaces.

(b) *Surfacing:* It is advisable that the land selected for storage of vehicles be surfaced with some dustless material, after grading. Surface types may include bituminous or concrete pavement, cinders, crushed stone, or washed gravel, with arrangements made to incorporate some simple, effective means of drainage of the area.

A permanent type surfacing is recommended since it provides:

(1) Good drainage
(2) Reduced maintenance
(3) Orderly layout of stalls with paint
(4) Attractive appearance

(c) *Fencing and Lighting* — There are certain proven advantages to be gained by enclosing a parking facility.

(1) It forces vehicles entering and leaving to use gates.
(2) In unattended areas, it reduces vandalism and protects employee vehicles.
(3) It defines overall limits for parking and adds greatly to appearance.

An industrial-type woven wire fence at least 5 feet in height is most commonly preferred at plant sites.

If the lot is to be used after dusk, floodlights, providing a minimum horizontal level of 0.2 footcandles (lumens per square foot), should be arranged in each parking row at intervals of 150 feet and mounted at a height of 25 feet. As high as 2 foot candles of illumination is used in large lots.

(d) *Aisles:* No special provision need be made for defining aisle widths since the extremities of parking stalls will fix aisle location.

Use of aisle space for parking purposes should be discouraged at all times, even during hours of peak demand. A well planned lot of sufficient capacity to accommodate parking demand will eliminate the need for aisle parking.

(e) *Entrances and Exits:* The number and location of entrances and exits must be in keeping with the lot size and flow. At least 26-foot width of entrance is required where 2-way flow is to be accommodated and where vehicles are turning into or off of a main route. Single lane entrances should be at least 14 feet wide at the property lines, and single lane exits a minimum of 10 feet. Gateways should be marked by suitable signs if they are to be used solely for entrance or exit. The preferred arrangement would separate the entrances from the exits and locating both at suitable distances away from any intersection.

At least one more exit than there are entrances should be provided to accommodate peak loads thrown upon exit facilities by employees leaving in a much shorter period than they arrive.

Cars should be parked in separate sections of the lot, adjacent to their respective entrances and exits. Each shift should be provided with a separate section where possible. If they are permitted to intermingle, a serious multiplication of crossing conflict occurs when they leave their stalls and seek divergent exits.

(f) *Plan of Circulation:* Traffic circulation within lots is ordinarily best when one-way counter-clockwise movement through the main aisles of the lot is posted and enforced except where the circulation pattern is arranged to conform with one-way traffic movement on adjacent streets.

One-way movement is best obtained at parking angles of 45 and 60 degrees when vehicles are arranged in double rows all heading in the same direction.

Figure 2 illustrates common flow diagrams for one and two-way movements. These simple line drawings are intended to merely indicate basic flow. They may be used in multiple or in combination.

In any case, the plan of circulation which is adopted should permit the

* For shopping centers ULI recommends 9′-0″ as minimum width of stalls.

PARKING LOT CIRCULATION ONE AND TWO-WAY MOVEMENTS
SIMPLE FLOW DIAGRAMS

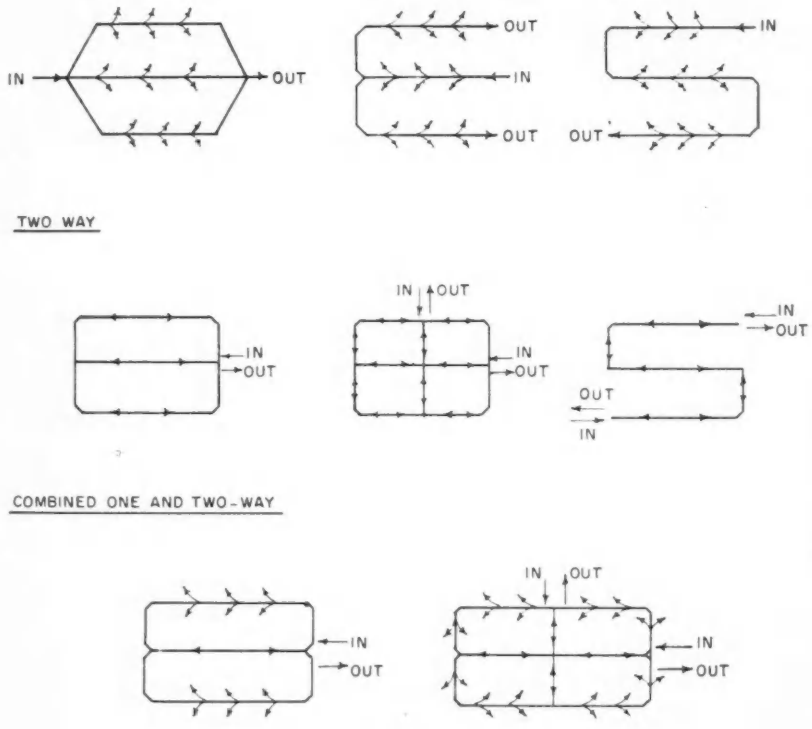

Figure 2

most flexible and smoothest flow possible as determined by the angle of parking, available aisle space and the location of entrances and exits.

Wherever control of flow can be facilitated by use of portable signs or pavement markings, such installations are recommended.

Directions and regulations should be explicit, brief and plainly visible to drivers, with symbols used when feasible.

3. *Accommodation for Transient Vehicles:*

The number of transient vehicles which require parking accommodations at or near plant grounds is dependent upon the nature of the business and manufacture conducted at each plant. These transient vehicles are generally representative of company executives, salesmen, servicing engineers, visitors, and employees' families.

The "stand-by areas" for transient vehicles can be distributed strategically at or near the plant premises in the form of separate parking rows of sufficient size to accommodate the transient unit assigned. The erection of appropriate informational signs will serve to direct drivers of transient vehicles to their assigned "stand-by area," thus eliminating confusion and misuse.

4. *Loading and Safety Zones:*

It is not always possible to segregate completely buses, passenger cars and pedestrians, but their coincidental use of the same road space or other area should be kept to an absolute minimum. Where substantial bus, taxi or transit service is required, provisions should be made for the loading and unloading of passengers (who are actually pedestrians) at points separated from other traffic movements.

Bus and transit stations in conjunction with loading platforms are a positive means of isolating these points of pedestrian attraction, and they should be strategically located to one side of access roadways and as close to the plant premises as is feasible.

Bus loading points should be designed with broad aisles and stalls, with raised platforms between the bus stalls to allow passengers ample protection while waiting to board, or when alighting.

Since the erection of loading platforms or waiting stations is often beyond the economic and cooperative means of those agencies concerned, bus loading at the curb is the most common method for accommodating employee passengers. This being the case, sufficient space must be *reserved* at the curb to permit buses and taxicabs to park parallel to the curb, free of moving traffic streams, and to allow employees to board or alight directly at the sidewalk. Complete prohibition of curb parking by other than the public carrier vehicles must, therefore, be enforced at these loading points.

B. Pedestrian Facilities

The handling of pedestrian movements is as important a problem outside of the plant proper as it is within the plant. Every care must be taken to reduce conflicting paths of pedestrians with vehicle movements to a minimum. When such conflicts *must* prevail, the need for confining and regulating pedestrian movements is imperative.

1. *Parking Areas:*

The provision of pedestrian gates, in addition to the main entrance and exit gates for vehicles will eliminate many of the common congestion problems at parking lot gates.

Pedestrian gates should not be less than three feet in width, and should exist in sufficient number and be so located as to permit easy access of the employees to that section of the parking lot wherein their vehicles are stored.

Raised sidewalks or separation walkways between rows of cars and bordering the fence line should be no less than six feet in width to permit free walking room, and at least 6 inches in height and faced with a curbing to prevent vehicles from parking thereon or crossing over.

Experience has proven that raised separation islands are expensive and seldom used by employees who prefer walking in aisleways; at many locations raised islands have created a serious tripping hazard and snow removal problem.

2. *Cross-walks and Sidewalks:*

All access roadways immediately adjacent to the plant and upon which groups of vehicles move in or out of the premises, should be provided with raised sidewalks to remove pedestrians from the traffic lanes.

Cross-walks should be marked on the pavement at all intersections immedi-

ately adjacent to the plant where there is material conflict between vehicles and pedestrian movement. Marked cross-walks should also be provided at other appropriate points where there is substantial pedestrian movement, as at long loading islands, or entrances to parking lots, or where pedestrians are permitted to cross between intersections, or where pedestrians could not otherwise recognize the proper place to cross.

Cross-walk lines should not be less than 6 nor more than 18 inches wide, and in no case be spaced less than 6 feet center to center.

3. *Footbridges, Tunnels, etc.:*

Special pedestrian facilities as footbridges and tunnels may be warranted where pedestrians are required to cross main-line railroad tracks and high-speed highways or heavily traveled highways in order to enter or leave the plant premises.

C. Access Roadways

Access roadways, as referred to in this discussion, are intended to mean those roads, streets, or highways which are adjacent to or about the plant premises and which, together with intersections, side-streets, driveways, etc., compose the plant "approach."

Access roadways may be lightly traveled rural feeder roads, heavily traveled rural highways, or urban through streets; and they may serve the interests of the plant alone, or provide travelway for the plant, city, state and all abutting property.

In any case, the importance to plant management of an access roadway lies in its fluidity and capacity to carry large numbers of employee vehicles regularly to and from the plant with safety, order and expedience.

In addition access roadways may serve to carry large quantities of material which a plant receives or ships by highway.

1. *Geometric Design and Layout:*

Access roadways should in no case be less than 20 feet in width to permit free turning movement into and out of parking areas and to reduce intersectional conflicts.

Where physically possible plant premises, including parking areas, should be sufficiently set back from major highways to reduce critical conflicts between the movement of vehicles serving the plant and public traffic. The ideal situation provides long feeder access roadways between the plant premises and the major thoroughfares, thus permitting plant traffic to "spread out" before it reaches major traffic streams. This situation is more common to plants located in rural areas than those located in dense industrial districts of large cities.

The requirements of special traffic design and control methods for access roadways will increase in proportion to the proximity of major thoroughfares to the plant premises. These special design and control features may include separate turning lanes, acceleration and deceleration lanes, cutbacks of curbs for bus loading, lane markings on pavements, traffic signal devices, SLOW and STOP signs, traffic officer controls, staggered hours for shift-change at adjacent plants, etc.

2. *Control of Approach and Departure:*

When access roads to parking areas are major highways carrying through traffic in excess of 400 vehicles per lane per hour, directional signs and pavement lane markings will be required to get employee vehicles into the proper lane well in advance of entrances to parking areas. For example, if two or three gateways are to be used as entrances to parking areas along major access highways, the vehicles which are to turn into each entrance should be directed into the right-hand lane as far back from each entrance as possible so that through moving vehicles may continue in the next lane to the left without being obstructed.

Minor access roadways to plant premises which intersect major highways may present a problem during peak periods of shift-change. The merging of heavy employee vehicle loads from the parking areas onto the major highways carrying in excess of 400 vehicles per lane per hour may create serious conflicts with moving traffic streams unless traffic signals or police protection are provided.

Traffic control signals at such intersections should be equipped with program timers, manual controls or semi-actuation to adjust the "go" or green interval to fit the needs of the unbalanced flows occurring during shift change.

The services of a traffic officer during shift-change is often warranted at unsignalized intersections of access roads and major highways, or at points of parking lot discharge directly onto major highways. The officer may coordinate his hand signals with those of any traffic signals in the immediate vicinity, thus permitting maximum efficiency of movement. If the services of a police officer are not available for necessary shift-change traffic control, a deputized plant guard should be substituted. Because of his limited authority, the plant guard can be used most effectively to aid drivers in selecting adequate gaps for entering main traffic streams.

3. *Routing of Vehicles:*

The direction of traffic flow on access roadways to and from the plant premises and into and out of parking areas should be carefully controlled to permit maximum freedom of movement and minimum conflict.

When access roadways are used primarily to serve plant vehicles, every attempt should be made to provide one-way flow of traffic between the plant premises and major highways. The strategic layout of parking areas will aid materially in providing a desired one-way circulating movement.

Large vehicles such as buses and trucks should approach and leave the plant on separate roadways. Each terminal facility can serve as a self-operating traffic circle or separation to force vehicles into one-way movement if properly designed.

Conclusion

The variations between plants as to available land area, proximity to major highways, quantity of plant traffic, etc., precludes the presentation in this report of any *absolute* specification for the design of terminal facilities and the control of traffic.

While each plant traffic problem requires individual consideration, it is certain that the solution of these problems will be greatly facilitated if the procedures and recommendations cited above are followed as guiding principles.

Figure 3, shown on page 1, is a typical layout of plant traffic control including parking, pedestrian and access roadway facilities.

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In Print

Orders for publications reviewed are to be addressed to publisher in each case and not to URBAN LAND.

An Economic Survey of Angleton, Brazoria County, Texas by Arvid A. Anderson. Bureau of Business Research, The University of Texas, 1958, 95 pp., maps, graphs, tables. $2.00.

Angleton, the county seat of Brazoria County, is a small but rapidly growing city in southeastern Texas. Recognizing the need for basic information and statistical data of interest to prospective new industrial firms, the Angleton Chamber of Commerce underwrote the cost of this economic survey, prepared by the staff of the Bureau of Business Research of the University of Texas. The study points up the city's strategic location between Freeport and Houston, traces the historical development of the area, discusses its physical and economic characteristics, and outlines the outlook for future industrial development.

Parking Industry Operating Cost Survey. National Parking Association, Inc., 711 14th Street, N. W., Washington 5, D. C. 1958. Unpaged. $10.00

This study about the automobile parking industry has numerous data on operating expenses of lots as compared with garages, the effects of labor costs on attendant-parked operations as opposed to self-service facilities, and the like. The statistics have been compiled by regions thereby making comparisons possible.

This report forms a handy reference for those interested in parking operations.

Government and Housing in Metropolitan Areas. Edward C. Banfield and Morton Grodzins. ACTION Series in Housing and Community Development. McGraw-Hill Book Company, 330 W. 42nd Street, New York 36, N. Y. 1958. 177 pp. $6.50.

In this book the authors have examined the effects of governmental structure upon the quality, quantity and price of housing and related facilities. They analyze the problems of metropolitan areas, point out the many complex roadblocks to their solution, and suggest possible corrective measures.

Perhaps the most significant advice is the underlying theme that due to the present political climate in this country, the success of solving metropolitan government is questionable. The authors appear to favor the use of cooperative agreements between central city and suburban governments in meeting this problem.

Income Tax Differentials. Tax Institute, Inc., 457 Nassau Street, Princeton, New Jersey. 1958. 258 pp. $6.00.

This book is the result of a symposium conducted in November 1957, to focus attention on the inequities of the present Federal Income Tax Code and Regulations.

The sixteen papers by the participants cover a wide variety of tax inconsistencies and point up the areas of needed tax reform.

This book should be of interest to practically everyone, since it touches a subject that directly affects the pocketbook of every taxpayer in the country.

The Human Side of Urban Renewal. Martin Millspaugh and Gurney Breckenfeld. Edited by Miles L. Colean. Fight-Blight, Inc., 32 South Street, Baltimore 2, Maryland. 1958. 233 pp., illus., tables. $3.50.

Many theories on the social effects of urban renewal have been advanced. Most have not been adequately documented, probably because of the relative newness of the program.

In this book, the authors shed a ray of factual light on a subtopic of urban renewal; viz, conservation. Data gathered from four cities' experiences which point up successes and failures, set the stage for their conclusions. These conclusions and recommendations state that any community planning a conservation program had best thoroughly consider the inhabitants of the area; for in the final analysis, they are the ones who will either "make or break" the project. The authors conclude this is true regardless of how much money, planning and other public support is expended in an effort to make the project a success.

Rental Housing: Opportunities for Private Investment. Louis Winnick. ACTION Series in Housing and Community Development. McGraw-Hill Book Company, 330 W. 42nd Street, New York 36, N. Y. 1958. 177 pp. $8.50.

Economist Winnick has brought together impressive data on the rental housing market as it is today, how it got that way, and what its future will be with, and without, government acting as a catalyst.

The postwar decline in rental housing is traced, showing how local taxing procedures, Federal housing and taxing policies, the mortgage market and many other factors have resulted in a decline in rental housing investment in favor of ownership. The author stresses that this trend is not necessarily a good omen, for a high rate of apartment construction is necessary for the healthy development of cities. He thinks that if certain changes are made in FHA policies that private investors may once again find rental housing attractive.

Of particular interest are factual data on: vacancy rates; relative costs of owning and renting; family characteristics of renters; and the attitude of private developers toward FHA.

Changes in Urban Occupance of Flood Plains in the United States by G. F. White, W. C. Calef, J. W. Hudson, H. M. Mayer, J. R. Sheaffer, and D. J. Volk. University of Chicago Press, Chicago, Illinois, November 1958, 235 pp., maps, photographs, tables. $4.00.

Those interested in the problems of urban occupancy of flood plains will find this study both illuminating and constructive. An intensive investigation of seventeen selected urban areas revealed that between 1936 and 1957 there was a net increase in the number of structures on the flood plains. This was true even in the two cities which declined in total population during that period. While the rates at which the various types of structure (commercial, residential, industrial, public, and transportation) increased differed markedly from area to area, overall there was a net increase in every category. Of particular interest are the land-use maps which show the patterns of occupance of the flood plains for the seventeen cities studied. The report is thorough and well written.

Town-Building in History. Frederick R. Hiorns. Criterion Books, Inc., 257 Fourth Avenue, New York 10, N. Y. 1958. 443 pp., illus. $15.00.

A great many well documented books have been written about the history of city planning in the past few years. This book is little more than a rehash of prior studies presented in one volume. It is narrow in its scope, being largely confined to Europe, and Great Britain in particular. The United States is ignored completely except for a brief mention in Section V.

This historical study of European towns and planning will be of primary interest to those seeking to broaden their cultural background knowledge of past urban growth problems.

Planning 1958. American Society of Planning Officials, 1313 East 60th Street, Chicago 37, Illinois. September 1958. 262 pp. $5.00.

The papers presented at the annual conference are published in this book. This compilation becomes the annual record of citizen and official planning programs ranging from administration of a planning office to urban renewal and zoning.